Solar panels help cut energy costs at Fort Sam Houston

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San Antonio, Texas, gets plenty of sunshine so why not convert that natural power to usable energy? Solar power creates green energy. It's good for the environment and saves money.

Bldg. 1350 at Fort Sam Houston in San Antonio now uses a 180 kilowatt-hour photovoltaic (PV) solar panel system to augment electricity from the power company. It's saving the installation nearly $6,000 a month in energy costs, and provides clean energy, no carbon dioxide emissions and less dependence on foreign oil.

The solar panels produce DC electricity and route it through an inverter where it is turned into AC energy that is accessible to anyone on the power grid in San Antonio. Once on the grid, the solar energy is used just like electricity that comes from the power company; this just comes from the sun. It is seamless to the end user.

The project is part of the Energy Conservation Investment Program (ECIP). Funding comes from Congress through the Military Construction Program. ECIP judges the different projects that installations submit. All the proposals include an economic analysis that includes cost, savings on investment ratio, payback, etc. Other types of projects include increased insulation, high efficiency boilers and motors – basically anything you can replace with a high efficiency device, lighting and direct digital controls.

"ECIP likes funding PV because it is green energy," said Will White, the Lead Program Engineer of the Utility Monitoring and Control System (UMCS) team at the U.S. Army Corps of Engineers, Engineering and Support Center in Huntsville, Ala. "The workmanship and the engineering on this job impressed me. We finished the job on time and within budget. We actually had some contingency funds that we did not use that we will return to the program. It was in all respects one of the most satisfying and successful jobs I've been associated with. No safety violations, no re-submittals, no unhappy customers… the guys just worked hard and did all they promised."

Rob Jay, the installation energy manager at Fort Sam Houston, and Gene Rodriguez, Fort Sam Houston's in-house technical consultant for PV systems, submitted the project to ECIP and it was funded in September 2005. The project was completed seven months later in April 2006.

"Initially our primary objective for going with PV was to try and not exceed the demand charge from City Public Service (CPS), our local utility company," Rodriguez said. "The solar constant is something like 1500 Btu's/sq. ft./ per day. That is a lot of energy going

to waste. Our chillers are drawing the most current flow from 3 to 5 p.m., almost matching the peak output of the PV system that it is interfaced with. Due to the reduction in maintenance dollars, a system almost has to be designed for neglect. Our PV system would have to be as close to low maintenance as you can get.

“It hasn't rained much lately in San Antonio, but for the most part an occasional rain is all that’s required to keep the collectors clean,” Rodriguez said. “But now we’re finally starting to pay attention to global warming and national security. Due to soaring oil prices, using a renewable alternate energy source, in this case solar energy that we have in abundance, to achieve energy independence in America not only makes sense but soon may become mandatory. More importantly, this will help procure the long term national security that comes with preserving the environment for our children and grandchildren, and cut our international foreign deficit by keeping our dollars here in America instead of sending them to some Middle Eastern country that doesn't like us and promotes terrorism.”

Partners in the project included the installation, the Corps of Engineers Fort Worth District, the Huntsville Center, Williams Electric Company of Fort Walton Beach, Fla., and Meridian Energy Systems of Austin, Texas.

“We competed the job between our UMCS ID/IQ contractors and received price proposals from three of them,” White said. “All the pricing came within 2-3 percent; however, due to the pressure of increased demand for PV panels from higher oil prices, they were all over the government amount allocated. We had to go back to ECIP for more money. Hank Gignilliat at Headquarters in Washington, D.C., was instrumental in getting the additional funding for the project.”

The system is fully integrated through controls to produce power onto the energy grid. It is metered and monitored separately from the power provided by the local electric company. The power that is generated from the sun is metered separately and the cumulative kW and dollar savings are displayed on the monitor in the master control room of the Energy Monitoring and Control System (EMCS). It is helping to reduce the demand cost and base utility cost while helping to meet Army energy goals.

“What is great about the use at Fort Sam Houston is that it provides additional energy for cooling during the peak demand periods,” White said. “You get more kilowatts of energy from the solar panels when the sun is the brightest. The solar energy powers the chillers in classrooms, barracks, etc.

“We had a challenge with the panels because from the time the contractor put in the bid to the time he wanted to buy the panels, the price had gone up due to rising costs and demand,” White said. “The contractor honored their proposed price and we ended up using a different source for the panels, but the panels were just as good.

“It was a team effort that turned out well,” White said.